

WHAT IS CLAIMED IS:

1. An information recording medium, comprising:
a substrate; and
5 a recording layer disposed above the substrate,
wherein the recording layer comprises, as constituent elements, Ge, Sb, Te, Sn, and at least one element M selected from Ag, Al, Cr, Mn, and N and is transformed in phase reversibly between a crystal phase and an amorphous phase by an irradiation of an energy beam.
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2. The information recording medium according to claim 1, wherein the recording layer is formed of a material expressed by a composition formula of $[(\text{Ge}, \text{Sn})_A \text{Sb}_2 \text{Te}_{3+A}]_{100-B} \text{M}_B$,
where $0 < A \leq 10$ and $0 < B \leq 20$.
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3. The information recording medium according to claim 2, wherein a content of Sn in the recording layer is 2 atom.% to 20 atom.%.
4. The information recording medium according to claim 1, wherein the
20 recording layer has a thickness of 5 nm to 15 nm.
5. The information recording medium according to claim 1, further comprising a first protective layer, a second protective layer, and a reflective layer,
25 wherein the first protective layer, the recording layer, the second protective layer, and the reflective layer are formed sequentially on the substrate.
6. The information recording medium according to claim 5, further
30 comprising an interface layer disposed in at least one position selected from a position between the first protective layer and the recording layer and a position between the second protective layer and the recording layer.
7. The information recording medium according to claim 5, further
35 comprising an optical absorption compensation layer disposed between the second protective layer and the reflective layer.

8. The information recording medium according to claim 1, further comprising a first protective layer, a second protective layer, and a reflective layer,

5 wherein the reflective layer, the second protective layer, the recording layer, and the first protective layer are formed sequentially on the substrate.

9. The information recording medium according to claim 8, further comprising an interface layer disposed in at least one position selected from
10 a position between the first protective layer and the recording layer and a position between the second protective layer and the recording layer.

10. The information recording medium according to claim 8, further comprising an optical absorption compensation layer disposed between the
15 reflective layer and the second protective layer.

11. A method of manufacturing an information recording medium including a substrate and a recording layer disposed above the substrate, the method comprising forming the recording layer by a vapor deposition
20 method,

wherein the recording layer comprises, as constituent elements, Ge, Sb, Te, Sn, and at least one element M selected from Ag, Al, Cr, Mn, and N and is transformed in phase reversibly between a crystal phase and an amorphous phase by an irradiation of an energy beam.

25 12. The method of manufacturing an information recording medium according to claim 11, wherein the vapor deposition method is at least one method selected from a vacuum evaporation method, a sputtering method, an ion plating method, a chemical vapor deposition, and a molecular beam epitaxy.
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13. The method of manufacturing an information recording medium according to claim 11, wherein the vapor deposition method is a sputtering method using a gas comprising at least one gas selected from nitrogen gas and oxygen gas and one rare gas selected from argon and krypton.
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14. The method of manufacturing an information recording medium

according to claim 11, wherein the recording layer is deposited at a deposition rate of 0.5 nm/sec to 5 nm/sec.

15. The method of manufacturing an information recording medium
5 according to claim 11, wherein the recording layer has a thickness of 5 nm to 15 nm.